



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
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Sacramento, California 95825-1846

IN REPLY REFER TO:
FWS/EC-03-007

November 8, 2002

Mr. Robert H. Schneider, Chair
Regional Water Quality Control Board
Central Valley Region
3443 Routier Road, Suite A
Sacramento, California 95827

Dear Mr. Schneider:

The U.S. Fish and Wildlife Service (Service) is writing today to bring to your attention certain issues involving selenium contamination in the surface waters of the Grassland area of the San Joaquin Valley, and to highlight ongoing concerns about the effects of this contamination on beneficial uses of these and downstream waters. A summary and recommendations are provided at the end of this letter.

Exceedances of Water Quality Objective for Grassland Wetland Supply Channels

Although waterborne selenium concentrations in the Grassland wetland supply channels have decreased substantially since the implementation of the Grassland Bypass Project in September 1996, the chronic selenium water quality objective to protect aquatic and aquatic-dependent species [2 ug/L (ppb), monthly mean) has been exceeded in at least some of these wetland supply channels on numerous occasions since 1996 (Chilcott, 2000, Eppinger and Chilcott, 2002). This water quality objective was adopted by the State for Grassland wetland supply channels and Salt Slough, and was approved by the U.S. Environmental Protection Agency. According to the Central Valley Regional Water Quality Control Board's (CVRWQCB) April 2000 report, *Selenium TMDL for Grassland Marshes* (California Regional Water Quality Control Board, 2000), the 2 ppb monthly mean objective was exceeded in 10 out of 24 months in the Santa Fe Canal and Camp 13 Canal, 11 out of 24 months in the San Luis Canal, and 5 out of 24 months in the Agatha Canal. From January 2000 through February 2002, the objective was exceeded 3 months in Camp 13 Canal, 4 months in Agatha Canal, 10 months in the San Luis Canal, and 2 months in the Santa Fe Canal (Grassland Bypass Project Monthly Reports 2000-2002). As described in the April 2000 TMDL report, these four channels are representative of supply channels that deliver water to the Grassland Marshes. Examples of significant exceedances of the 2 ppb objective were observed in Grassland wetland supply channels during the months of March and April 2001. According to U.S. Bureau of Reclamation (Reclamation) data, there was a

selenium spike during March and April 2001, when measured concentrations reached a high of 7.6 ppb at station K (Agatha Canal) on March 7, 2001, (Grassland Bypass Project, Monthly Data Report, May 2001).

Delta Mendota Canal as a Source of Selenium Contamination

The major source of supply water to the Grassland Marshes and to the agricultural lands of the Grassland Drainage Area is the Delta Mendota Canal (DMC), via the Mendota Pool and the Central California Irrigation District Main Canal (CCID Main Canal). Selenium concentrations in all three of these waters have exceeded the 2 ppb monthly mean limit on several occasions since the Grassland Bypass Project was implemented. Sources of selenium to the DMC include: groundwater pumping into the Mendota Pool, recycling of San Joaquin River drainage into the federal pumps in the south Delta, flood flow and sediment loading from the Panoche and Silver Creek watersheds, and discharge from DMC subsurface drains and six shallow groundwater sumps (Firebaugh sumps) operated by Reclamation in the Firebaugh Canal Water District (Pierson et al., 1987; Chilcott, 2000).

In the 1950's Reclamation installed check drains and the Firebaugh sumps between Mileposts 99 and 110, parallel to the DMC, to collect small quantities of seepage water or surface runoff to prevent accumulation and possible damage to the canal bank or adjacent lands. Water collected in the subsurface drains is discharged into the DMC by the sumps through six drainage inlet structures. Although flow from Reclamation's Firebaugh sumps is relatively small, selenium concentrations in discharged water have ranged from 57 - 2,100 ppb between 1985 and 2000 (U.S. Bureau of Reclamation, April 2002). Reclamation monitoring data up to 1994 revealed water discharged from sump "K" exceeded California's hazardous waste threshold for selenium (1,000 ppb) in one or more months sampled annually. However, Reclamation subsequently adopted a biannual monitoring schedule in 1995, with the CVRWQCB's approval, that discontinued sampling of the sumps during months with the highest historical selenium concentrations (early winter). Unfortunately, with this reduced monitoring regime it is no longer possible to fully assess the extent to which these sumps contribute to selenium concentrations in the DMC and wetland supply channels.

In October 1987, the CVRWQCB completed a report titled *Investigation of Check Drains Discharging into the Delta Mendota Canal* (Pierson et al., 1987). The report noted that:

"Monitoring of the DMC has shown elevated selenium levels (1-10 ug/L) in its lower reach; similarly monitoring of the Mendota Pool has shown elevated selenium levels (1-4 ug/L). In consideration of the uses of the water from the DMC and Mendota Pool, these levels of selenium are cause of concern."

The report further describes four physical features which may contribute to selenium in the DMC between O'Neill Forebay and the Mendota Pool: the subsurface drainage sumps operated by Reclamation; the 93 check drains on the upslope berm of the DMC which allow any flow with an elevation higher than the water level in the DMC to enter the canal; the pressure relief valves in

the bottom of the DMC; and intrusion through the earth lined section of the DMC. Of these four physical features, the report found that the most likely sources of selenium into the DMC were Reclamation's subsurface drainage sumps (Firebaugh sumps) and the DMC check drains. The CVRWQCB found that during one sampling trip in July 1986, 20 check drains were flowing, 5 showed evidence of recent use, and 11 either could not be located or had been abandoned. The report further concluded:

"Elevated levels of selenium in the DMC are a management problem and should be able to be controlled to protect beneficial uses."

In addition to general fish and wildlife concerns, we note that the giant garter snake (*Thamnophis gigas*, federally listed as threatened) occurs in Fresno Slough--of which Mendota Pool forms a part.

Water concentrations of selenium in the DMC at O'Neill Forebay (upstream of the check drains and the Firebaugh sumps) have been generally at or below the detection limit of 0.4 ppb since 1999 to the present time (U.S. Bureau of Reclamation, April 2002). However, a water concentration of 2 ppb selenium was exceeded in the DMC one-half mile downstream of the Firebaugh sumps in 7 of 24 samples from 1999 through 2001. Data from the DMC upstream (Farm Bridge) and downstream (Washoe Avenue) of the Firebaugh sumps in 1999-2001 show that selenium concentrations in the DMC increased downstream of the Firebaugh sumps in 30 of 36 samples. The average increase in concentration was 0.94 ppb. Seasonally, the exceedances in 1999-2001 occurred in the winter and spring (December to April) (U.S. Bureau of Reclamation, April 2002).

Water concentrations of selenium in the DMC at Bass Avenue and the DMC terminus collected in April 2001 were 2.38 and 3.32 ppb, respectively. These data suggest that selenium concentrations in the DMC source water contributed to the significant exceedances of the 2 ppb chronic water quality objective for Grassland wetland water supply channels during March and April 2001.

In an April 2002 report titled, *Review of Selenium Concentrations in Wetland Water Supply Channels in the Grassland Watershed (Water Years 1999 and 2000)* (Eppinger and Chilcott, 2002), the CVRWQCB also indicated a close correlation between selenium in source water and selenium in wetland supply channels, as represented by the CCID Main Canal at Russell Avenue (source) and Agatha and Camp 13 channels, during the non-flood water years of 1999 and 2000. The report noted that when the source water had elevated selenium concentrations (above 2 ppb) a corresponding increase was noted in the wetland water supply channels.

Regulation of the Firebaugh Sumps and DMC Check Drains

The CVRWQCB requires Reclamation to comply with a Monitoring and Reporting Program, No. SJR027, associated with trace elements collected by the Firebaugh sumps and discharged into the DMC. The monitoring program identifies monitoring stations, constituents to be analyzed,

implementation of a quality assurance program, and reporting requirements. However, there is no Monitoring and Reporting requirement imposed for the 93 check drains along the DMC, and the continued contribution of selenium and other contaminants from the surface drainage and subsurface drainage discharge these check drains carry into the DMC is unknown at this time.

On 18 March 2002, the CVRWQCB's Fresno Branch Office provided a letter to the Westside Resource Conservation District, Fresno County, clarifying the regulatory requirement for the blending of drainage water used for the irrigation of salt tolerant crops. The letter noted that, "[i]f the reuse of drainage water causes a nuisance, threatens to impair the beneficial uses of ground or surface waters, or is not beneficially used, then additional control and possibly enforcement actions may be needed." Further, the letter stated that, "...any operation that adds unusable drainage water to useable water and results in an unusable blend would probably be considered an unreasonable use of water." The letter concludes that, "The Regional Board believes that a mechanism needs to be developed to ensure drainage water is used for agronomic benefit, protects water quality, and prevents nuisance conditions so that discharge is not disposed of improperly."

Applicability of Grassland Bypass Project Waste Discharge Requirement

Attachment 2 of WDR No. 5-01-234, Waste Discharge Requirements for San Luis and Delta-Mendota Water Authority and United States Department of Interior, Bureau of Reclamation, Grassland Bypass Project (Phase II), Fresno and Merced Counties, identifies the Grassland Drainage Area served by the Grassland Bypass Project. The Grassland Drainage Area identified in this attachment includes the area currently discharging into the DMC from Reclamation's Firebaugh sumps and approximately half of the DMC segment between O'Neill Forebay and Mendota Pool with check drains. This attachment suggests that WDR No. 5-01-234 should apply to the Firebaugh sumps and roughly half of the check drains. Discharge prohibitions of WDR No. 5-01-234 include the following:

1. The discharge of waste classified as hazardous as defined in Section 2521 (a) of Title 23, CCR, Section 2510, et seq., is prohibited.
2. The discharge of agricultural subsurface drainage water to Salt Slough and the wetland water supply channels identified in Appendix 40 of the Basin Plan is prohibited unless water quality objectives for selenium are being met.

If WDR No. 5-01-234 does apply to the Firebaugh sumps and DMC check drains within the Grassland Drainage Area identified in Attachment 2, then operation of the Firebaugh sumps and some discharges into the DMC from the check drains may be occurring in violation of this WDR. Part of Monitoring and Reporting Program No. SJR027 has demonstrated that, at least on an annual basis, discharges from one of the Firebaugh sumps has exceeded hazardous waste levels for selenium. Further, discharge of agricultural subsurface drainage water to the DMC (source waters of the Grassland wetland supply channels) continues even though exceedances of water quality objectives in the Grassland wetland supply channels is occurring. We concur with the CVRWQCB's previous finding (Pierson et al., 1987) that these discharges are a management problem capable of control.

Previous Service Comments

The Service wrote the CVRWQCB regarding exceedances of the Grassland wetland supply channel monthly mean objective of 2 ppb on December 19, 1997, (Service File No., FWS/EC-98-013). The Service noted that, "Impounded wetland systems like those on refuges are very susceptible to adverse effects from moderately elevated concentrations of selenium in their water supply." The Service recommended that the sources of selenium causing exceedances need to be identified, and measures need to be taken to control those sources.

In addition, the Service provided a letter to the State Water Resource Control Board (SWRCB) on June 14, 2002, with specific comments on selenium in the Grassland Wetlands and DMC source waters (Service File No., FWS/EC-02-049). In this letter the Service recommended that: 1) revision of the TMDL for the Grassland Marshes be assigned a high priority in the 303(d) list update; 2) the SWRCB and CVRWQCB take action to address selenium contamination in source water (DMC and Mendota Pool) which is preventing attainment of the water quality objectives in wetland supply channels; and 3) the SWRCB should place appropriate segments of the DMC, Mendota Pool, and Main Canal on the 303(d) list of impaired waters, and assign a high priority to TMDL development. The SWRCB recently added 38 miles of the DMC and Mendota Pool as waters impaired by selenium to their Final Draft 303(d) list, dated 15 October 2002, and included agriculture and agricultural return flows as sources of that impairment.

The issue of selenium contamination in the DMC was discussed in the Grasslands Bypass Project Biological Opinion (Service File No., 1-1-01-F-0153), a copy of which was sent to both the CVRWQCB and SWRCB. The Service also provided both Boards with a copy of a memo from the Service to Reclamation on the Water Quality Monitoring Program for the Delta Mendota Canal dated July 11, 2002, (Service File No., 1-1-02-I-1880). In this memo, the Service recommended that Reclamation include more intensive sampling of DMC waters just upstream and downstream of the Firebaugh sumps, and systematic, direct sampling of discharges from the Firebaugh sumps. The Service stated that relative to selenium contamination in the DMC, "Past data are adequate to justify implementing preventative measure(s) now."

Conclusion

The following summarizes key points of this letter:

- 1) Contributing sources of selenium contamination in the Grassland wetland supply channels include source waters from the DMC and Mendota Pool;
- 2) Selenium contamination in the DMC has been identified as a continuing problem by the CVRWQCB;
- 3) Likely sources of selenium contamination in the DMC include discharges from the DMC check drains and Reclamations's Firebaugh sumps;

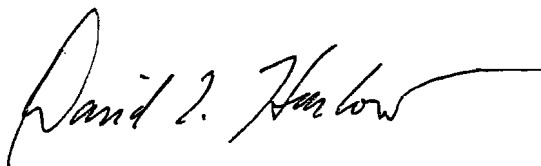
- 4) Exceedances of the State-adopted, federally approved chronic water quality objective for selenium in the Grassland wetland water supplies are a continuing problem and are resulting in failure to protect designated beneficial uses, including use by wildlife species;
- 5) Subsurface drainage contamination of the DMC is an operation that, at least on an annual basis, results in an unusable blend and should be considered an unreasonable use of water;
- 6) Exceedances of the water quality objective for the Grasslands wetland supply channels are correlated with selenium concentrations in the source waters from the DMC.

Recommendations

The lines of evidence implicating selenium in source waters from the DMC, Mendota Pool, and the Main Canal are sufficient to trigger corrective actions by the CVRWQCB. Development of a selenium TMDL for the sources of wetland supply channel water, as directed in the CVRWQCB's TMDL report, and application of a WDR for the Firebaugh sumps and DMC check drains appears necessary in light of the data presented above. In addition, the Service recommends that any WDR issued include a monthly monitoring regime for the Firebaugh sumps to allow an adequate assessment of their contribution to selenium concentrations in the DMC and wetland supply channels.

We appreciate your priority attention to this matter. The Service would like to have an opportunity to provide comments on any Waste Discharge permitting that applies to the Firebaugh sumps or DMC check drains. If you have any questions or comments about the Service's concerns outlined in this letter, please contact Mr. Thomas Maurer or Ms. Joy Winckel of our staff at (916) 414-6590 or 414-6650, respectively.

Sincerely,



David L. Harlow
Acting Field Supervisor

cc:

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National Marine Fisheries Service, Protected Resources Division, Sacramento, CA
U.S. Environmental Protection Agency, Region 9, Water Division, San Francisco, CA
U.S. Geological Survey, Water Resources Division, Menlo Park, CA

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